

**REMARKS**

**I. Status of Claims**

Claims 1-3 and 5-8 are pending in the application. Claims 1 and 8 are the independent claims and are currently amended. Claim 4 was previously canceled.

Claims 1, 5, 6, and 8 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent Application Publication No. 2004/0035101 (“Imai”).

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Imai et al. in view of U.S. Patent No. 6,829,886 (“Nakata”).

Claim 7 is allowed.

The Applicant respectfully requests reconsideration of the rejections in view of the following remarks.

**II. Allowed Claims**

Claim 7 is allowed.

**III. Pending Claims**

Independent claims 1 and 8 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Imai.

It is respectfully submitted that claim 1 is patentable over the cited references at least because it recites, *inter alia*, “...a determining section that determines whether the vehicle is driving downhill, wherein the regeneration control section ***suspends the heating control when the determining section determines that the vehicle is driving downhill.***” (emphasis added)

It is respectfully submitted that claim 8 is patentable over the cited references at least because it recites, *inter alia*, “...determining whether the vehicle is driving downhill...” and “***...suspending the supply of fuel to the exhaust purification catalyst when the vehicle is determined to be driving downhill...***” (emphasis added)

Certain embodiments of the present Application are directed to a system that controls the addition of fuel to the exhaust gas in order to purify various catalysts. The addition of fuel

increases the temperature of the catalyst bed, thus, thereby purifying the filter. However, under certain driving conditions, such as driving downhill, for example, the temperature increase caused by the addition of the fuel is offset by various factors. This may cause the purification cycle to fail. Thus, the present application describes, among other things, a system that determines whether additional fuel should be added to the exhaust based on whether the vehicle is driving downhill. Therefore, embodiments of claims 1 and 8 of the present Application require a regeneration control section that “*...suspends the heating control when the determining section determines that the vehicle is driving downhill...*” and “*...suspend[s] the supply of fuel to the exhaust purification catalyst when the vehicle is determined to be driving downhill...*,” respectively.

In contrast, Imai describes a regeneration control method for removing particulate matter (PM) “while suppressing the deterioration of fuel consumption and preventing a [sic] drivability from being deteriorated.” (Imai at Abstract.) The device itself makes no mention of making a determination of whether a vehicle is driving downhill, as recited in claim 1 of the present application. Further, Imai fails to describe a regeneration controller that suspends the heating of the bed of a catalyst when the determining section determines that the vehicle is driving downhill.

In fact, the term “downhill” is found only once in Imai: in the background section. In paragraphs [0017] and [0018] of Imai, the reference discusses various operating conditions where the exhaust gas temperature of a vehicle may be low. Imai lists “engine break functioning operation on the downhill” as one of these conditions. However, Imai makes no mention of determining whether the vehicle is driving downhill or how it may be determined that the vehicle is doing so. In addition, Imai never describes using this determination of whether a vehicle is driving downhill to suspend a regeneration operation.

Furthermore, it is not inherent that Imai performs this determination and controls its regeneration operation based on the determination. To the extent that the Office Action may be relying on the inherency doctrine, the Office must provide a “basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics *necessarily* flows from the teachings of the applied art.” (See M.P.E.P. § 2112; emphasis in original; and see Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int'l. 1990)). Thus, the M.P.E.P. and the case law make clear that simply because a certain result or characteristic

may occur in the prior art does not establish the inherency of that result or characteristic. Here, Imai merely lists “engine break functioning operation on the downhill” as one possible cause among several possibilities for the fuel being burned scarcely and exhaust gas flowing at low temperature. That is, the fuel being burned scarcely and exhaust gas flowing at low temperature are not *necessarily* caused by driving downhill. Therefore, Imai fails to teach or suggest each and every feature recited in the independent claims 1 and 8.

Nakata does not make up for the deficiencies of Imai. Although the Examiner asserts that Nakata describes that “it is conventional in the art to judge an operating state of the engine being in a low load condition (i.e. vehicle coasting) . . . in order to execute a fuel-cut operation,” Nakata does not teach determining whether a vehicle is driving downhill as a means to suspend regeneration. (Office Action at 4.)

Accordingly, the Examiner has failed to show that Imai teaches each limitation of claims 1 and 8 of the present application. For this reason, the Examiner’s rejection of these claims and all claims depending therefrom is inappropriate.

Having said that, the Applicant respectfully submits that, without waiving any argument and to advance prosecution, claims 1 and 8 *are amended to further distinguish certain embodiments of the present invention from Imai.*

In certain embodiments of the present invention, fuel for heating up the catalyst is added via a fuel adding valve 68 (e.g., shown in FIG. 1), which is located downstream of the cylinders and on the pipeline for the exhaust gas. That is, embodiments of the present invention add fuel to the exhaust gas instead of to the cylinders of the engine. In contrast, Imai only concerns post-injection that injects fuel into a cylinder during a down stroke of a piston. The post-injection is referred to as “after injection” and may be performed by the fuel injection valve 58 shown in FIG. 1 of the present Application. *See* paragraph [0038] of the published Application (“As in the other modes, an after injection is performed by the fuel injection valve 58 in this mode in some cases. The after injection refers to fuel injection to the combustion chambers 4 during the expansion stroke and the exhaust stroke.”)

Accordingly, to highlight this distinction, the invention of claim 1 is amended to recite “*...a fuel adding valve* for injecting fuel in exhaust gas...” and “*...a regeneration control section, wherein the regeneration control section controls regeneration of an exhaust purification catalyst through heating control, in which fuel is supplied to the exhaust purification catalyst*

*via the fuel adding valve*, thereby increasing a bed temperature of the catalyst....” Similarly, claim 8 is amended to recite “...supplying fuel to an exhaust purification catalyst to increase a bed temperature of the catalyst, thereby regenerating the exhaust purification catalyst, *wherein the fuel is supplied to exhaust gas via a fuel adding valve.*”

Thus, the inventions of claims 1 and 8 are also patentable over Imai for at least these reasons.

#### **IV. Conclusion**

The Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is respectfully requested.

The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application.

Applicants do not believe that any additional fees are required in connection with this submission. Nonetheless, Applicants authorize payment of any additional fees under 37 CFR §§ 1.16 or 1.17 or credit any overpayment to Deposit Account No. 11-0600.

Respectfully submitted,

Dated: January 15, 2009

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